# Infrared Optical Property Characterization and Standards Development at NIST (Invited)

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A facility for the spectral characterization of infrared optical properties of materials has been established in the Optical Technology Division of NIST. Absolute transmittance, reflectance, absorptance, emittance and refractive index are measured using custom instrumentation coupled to Fourier Transform Spectrometers. Solid samples such as windows, filters, mirrors, and coatings, of both specular and diffuse character are measured. High quality polarizers have been developed for variable angle reflectance and transmittance measurements, as well as Mueller matrix characterization of samples and polarizer components. Cryostats are used for sample temperature control in transmittance, reflectance and refractive index measurements. An integrating sphere and hemi-ellipsoid are used for diffuse reflectance and transmittance. FTIR refractometry is used for refractive index measurement. This facility is available for characterization of both internal and external user samples. A set of Standard Reference Materials (SRM's) for infrared optical property calibration is also being developed. Currently available SRM's include wavelength (#1921a & #2035; 1 to 18 micrometers) and transmittance (#2053, 4, 5, & 6; 2 to 25 micrometers) standards. SRM's for reflectance and emittance are in process. A description of the facility, specialized instrumentation, measurement methodologies, error evaluation and uncertainty estimates will be presented.